Duwamish Waterway Sediment Characterization Report

Summary of Findings

In 1997, the Natural Resource Trustees for the Duwamish River[1] initiated a sediment characterization study of the lower Duwamish River. The area studied extends from near the south tip of Harbor Island upstream to river mile 7, which is about a mile upstream of the upper navigational turning basin.

The study focused on determining levels of polychlorinated biphenyls (PCBs) and polychlorinated terphenyls (PCTs) found in river sediments throughout the study area.

The objectives of the study were to:

- Characterize the nature and extent of total PCB and PCT contamination in the study area;
- Evaluate potential effects on natural resources based on PCB contamination in sediments;
- Perform a preliminary analysis of the concentrations and distribution of PCBs and PCTs throughout the study area to support subsequent studies on the nature and scale of potential natural resource injuries; and
- Perform a preliminary analysis of the types and distribution of PCBs and PCTs throughout the study area, as a preliminary step in considering possible sources of contamination.

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[1] The United States Department of Commerce, acting through the national Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior; the State of Washington, acting through the Department of Ecology (WDOE); the Muckleshoot Indian Tribe; and the Suquamish Tribe.

The major findings of the study are:

1. Almost 71 acres of the sampled area of the Waterway, or just under 20%, are estimated to have PCB contaminant levels that exceed the Washington State Sediment Quality Standard (SQS). (The SQS corresponds to a sediment quality that will result in no adverse effects, including no acute or chronic adverse effects, on biological resources.)

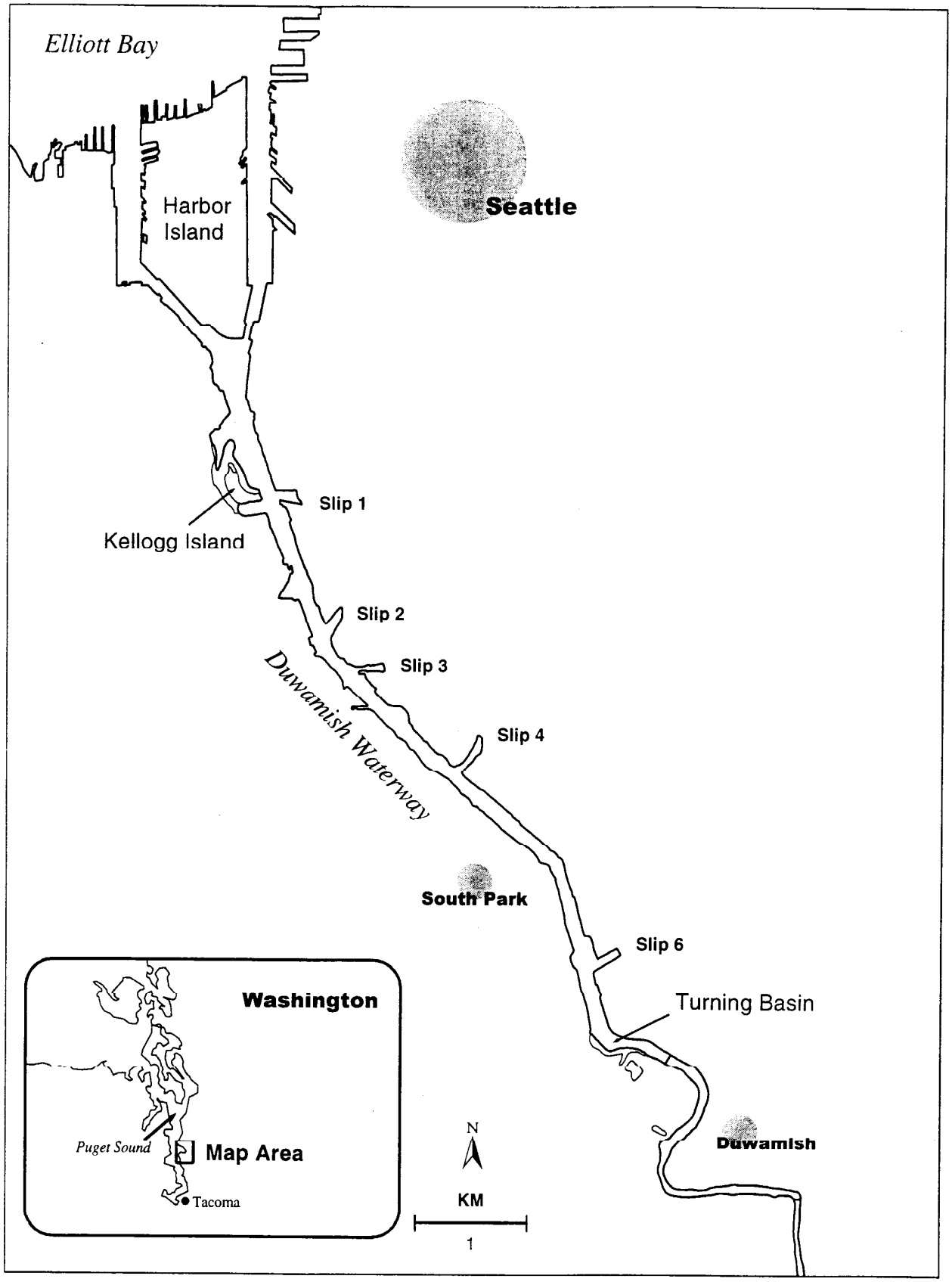
2. The most contaminated region is the middle portion of the Waterway north of Slip 6 and south of Slip 2.

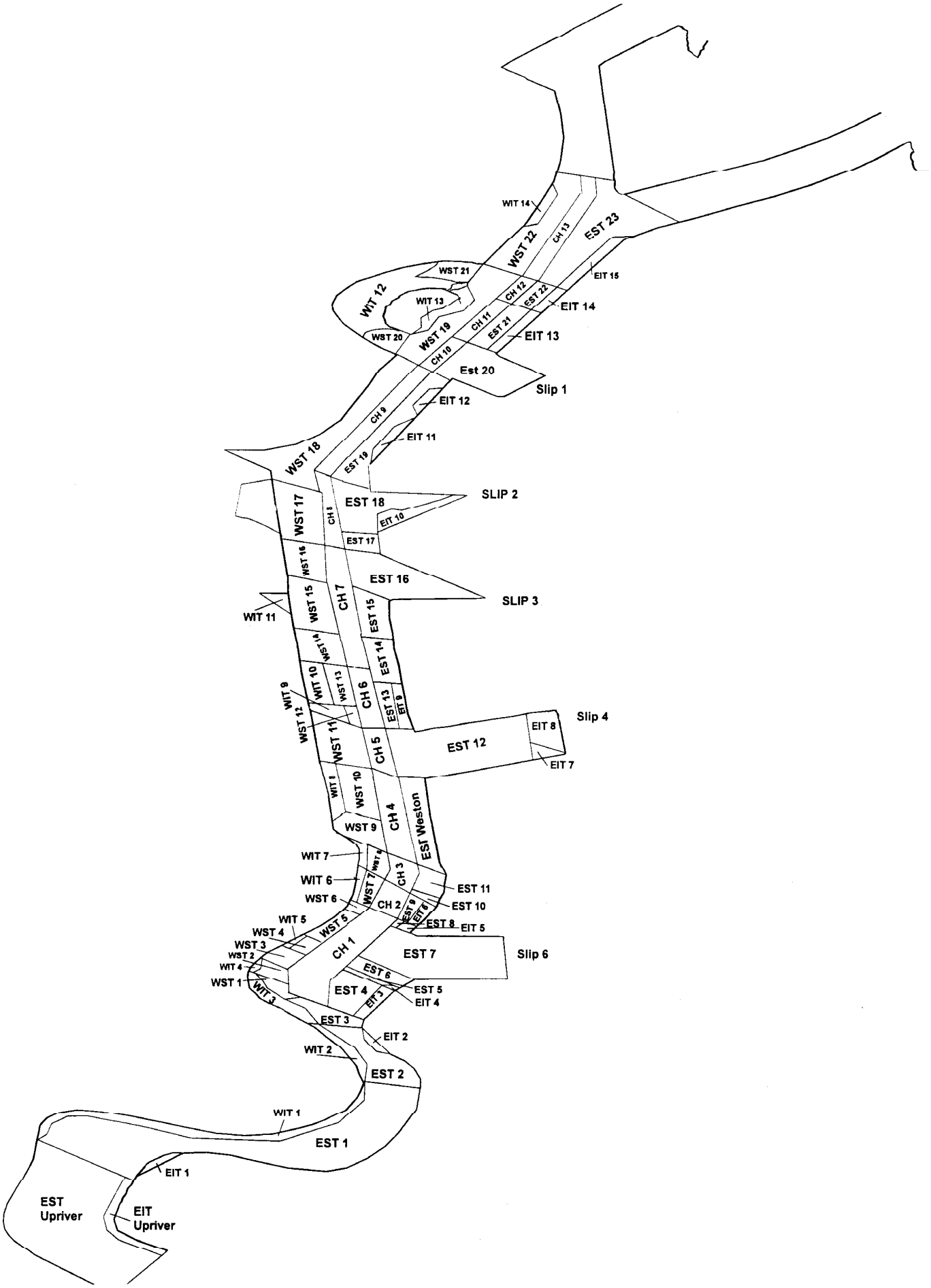
3. Seventeen of eighteen samples collected from within Slip 4 exceeded the SQS for PCBs.

4. Concentrations of PCBs in many sub-segments of the middle portion of the Waterway are 10-100 times the Washington State Sediment Quality Standard.

5. Based on published studies of the exposure, uptake, and bioaccumulation of PCBs by organisms, the quantity and concentration of PCBs found in Duwamish Waterway sediments is potentially sufficient to cause injuries to natural resources.

LIST OF EXHIBITS


Elliott Bay
Harbor Island
Seattle
Kellogg Island
Slip 1
Slip 2
Slip 3
Slip 4
Duwamish Waterway
South Park
Slip 6
Turning Basin
Duwamish
Washington
Puget Sound
Map Area
Tacoma
N
KM
1


WIT 14
WST 22
CH 13
EST 23
EIT 15
WST 21
WIT 12
WIT 13
CH 12
EST 22
EIT 14
WST 20
WST 19
CH 11
EST 21
EIT 13
CH 10
Est 20
Slip 1
EIT 12
CH 9
EIT 11
WST 18
EST 19
SLIP 2
EST 18
WST 17
CH 8
EIT 10
EST 17
WST 16
EST 16
SLIP 3
WIT 11
WST 15
CH 7
EST 15
WST 14
EST 14
WIT 10
WST 13
CH 6
WIT 9
WST 12
EST 13
EIT 9
Slip 4
EIT 8
WST 11
CH 5
EST 12
EIT 7
WIT 8
WST 10
CH 4
WST 9
Est Weston
WIT 7
WST 8
CH 3
WIT 6
WST 7
EST 11
WST 6
CH 2
EST 10
WIT 5
WST 5
EST 9
EIT 6
EST 8
EIT 5
WST 4
WST 3
CH 1
EST 7
Slip 6
WST 2
WIT 4
EST 6
WST 1
EST 4
EST 5
WIT 3
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EIT 1
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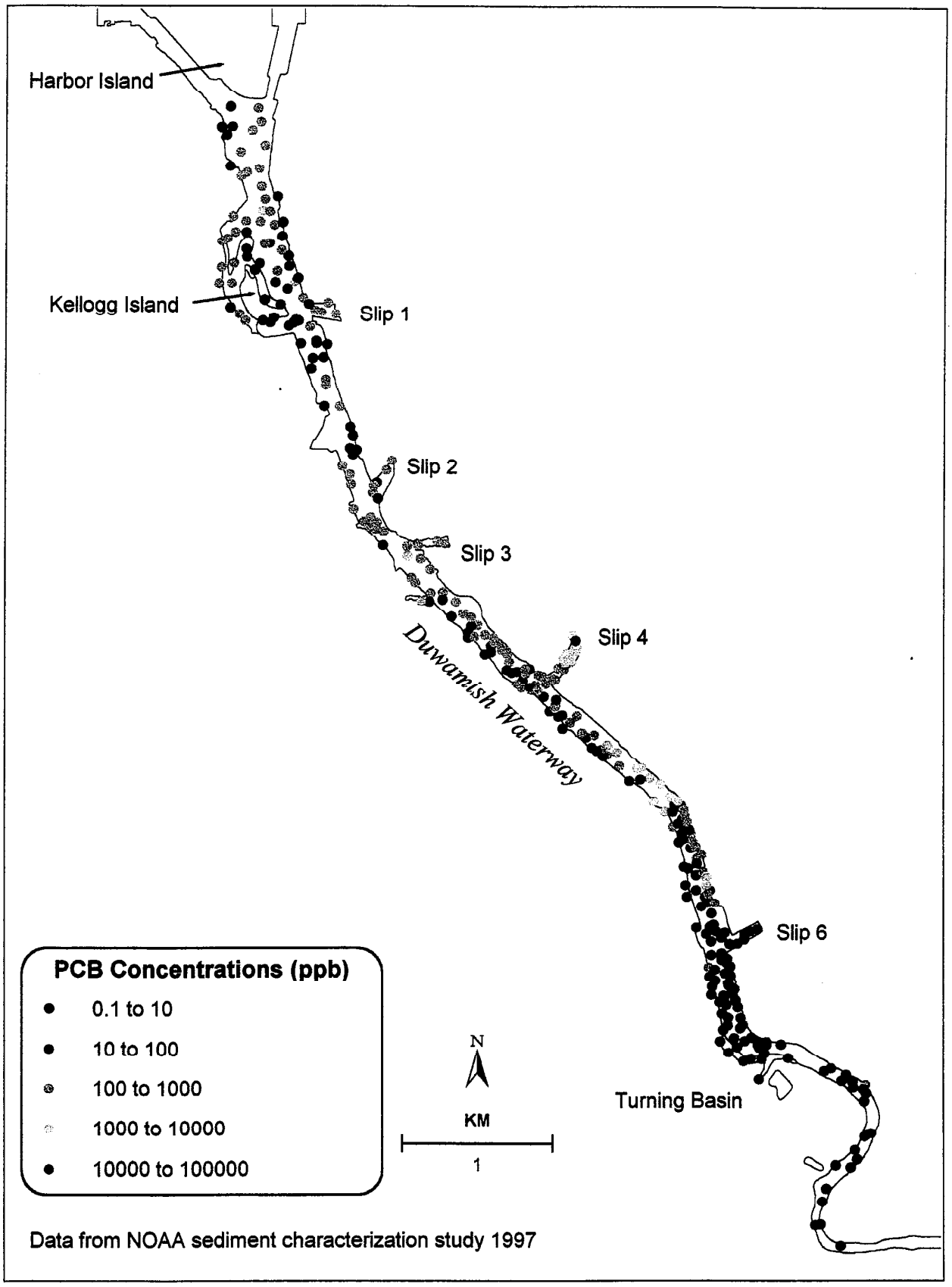
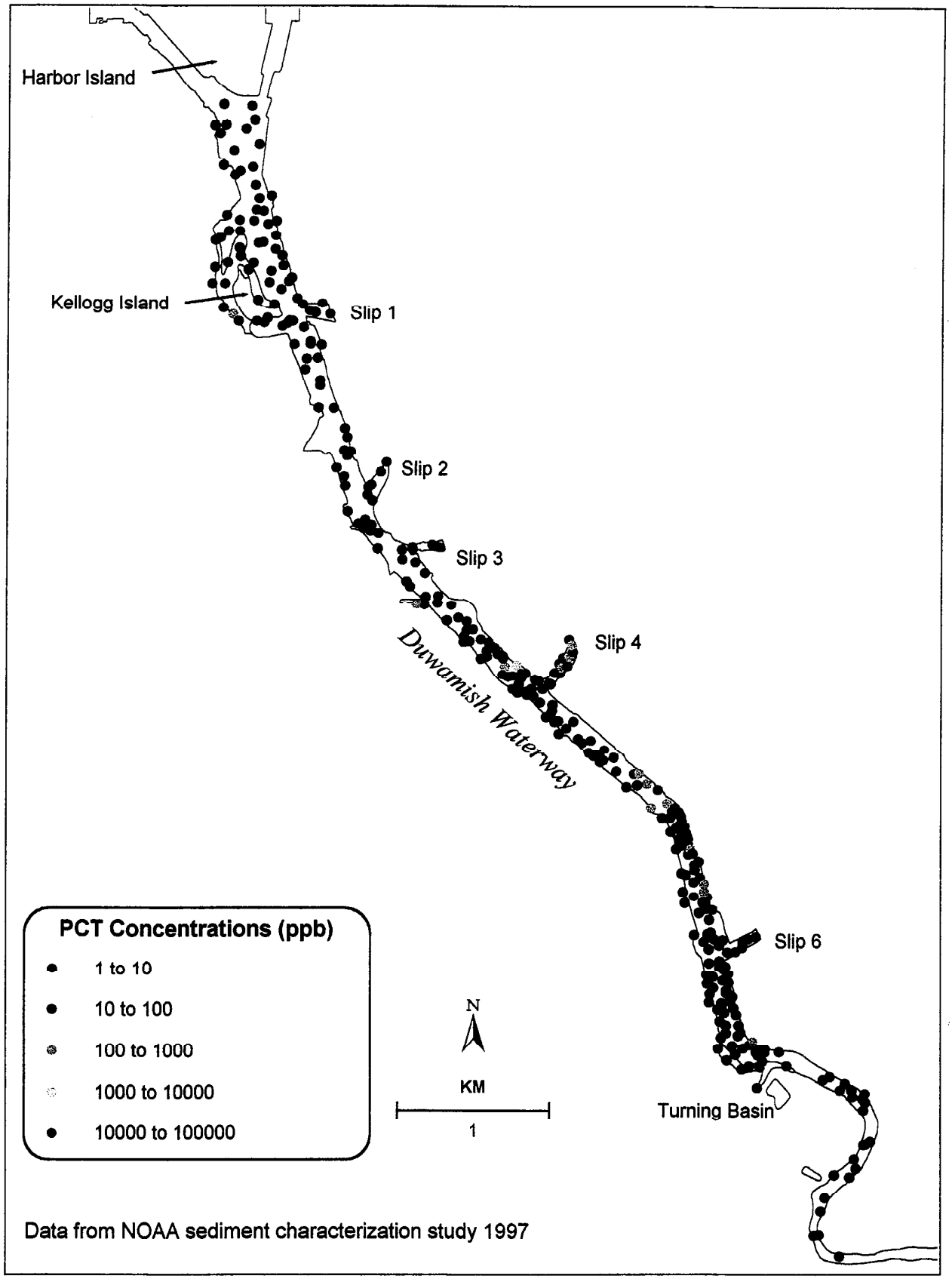
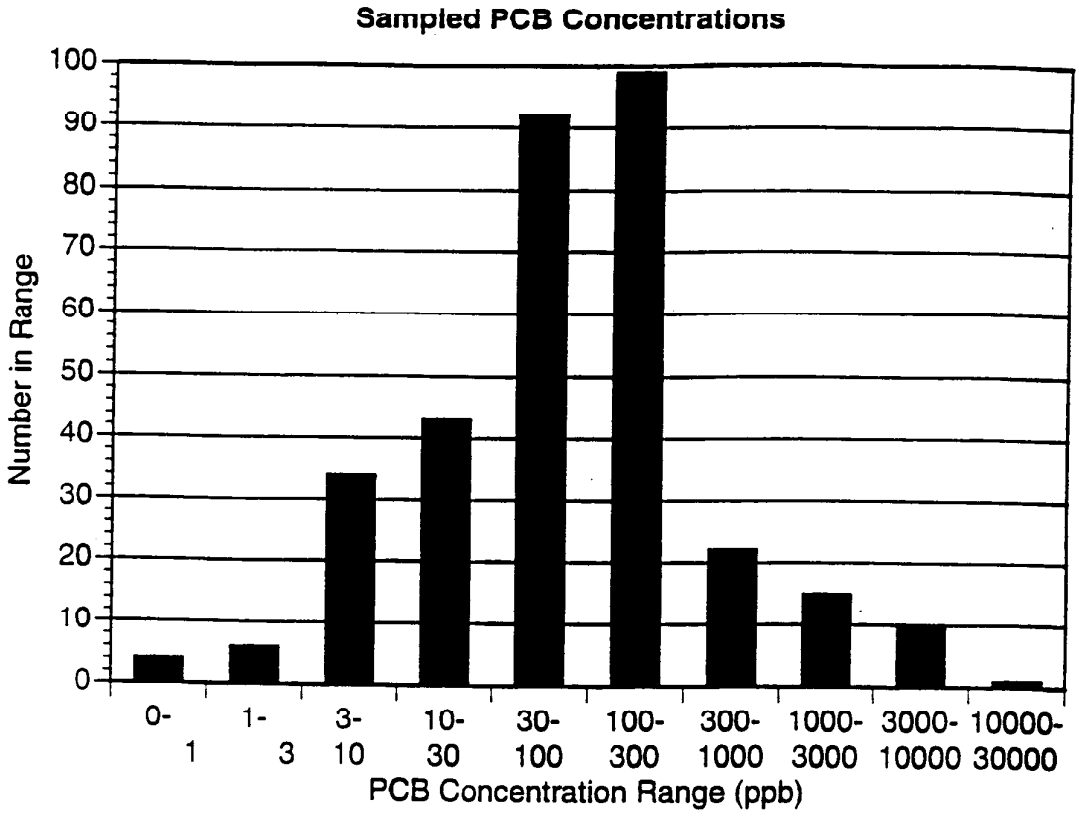
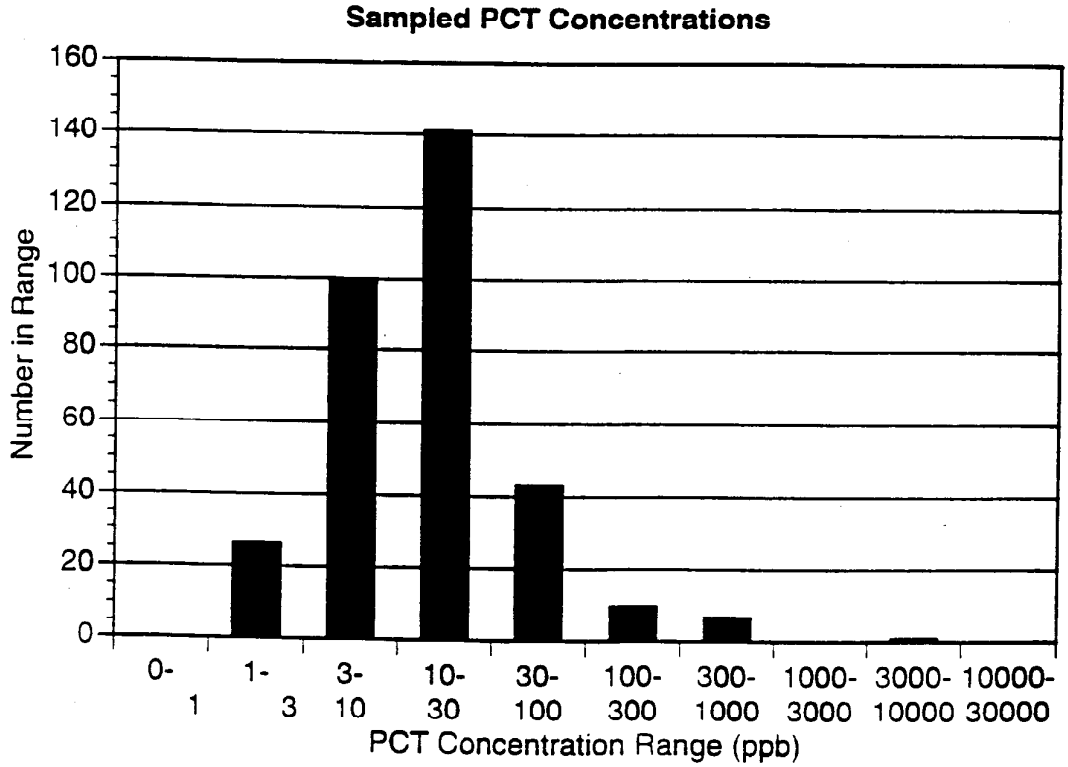

Harbor Island
Kellogg Island
Slip 1
Slip 2
Slip 3
Slip 4
Duwamish Waterway
Slip 6
Turning Basin
PCB Concentrations (ppb)
0.1 to 10
10 to 100
100 to 1000
1000 to 10000
10000 to 100000
N
KM
1
Data from NOAA sediment characterization study 1997

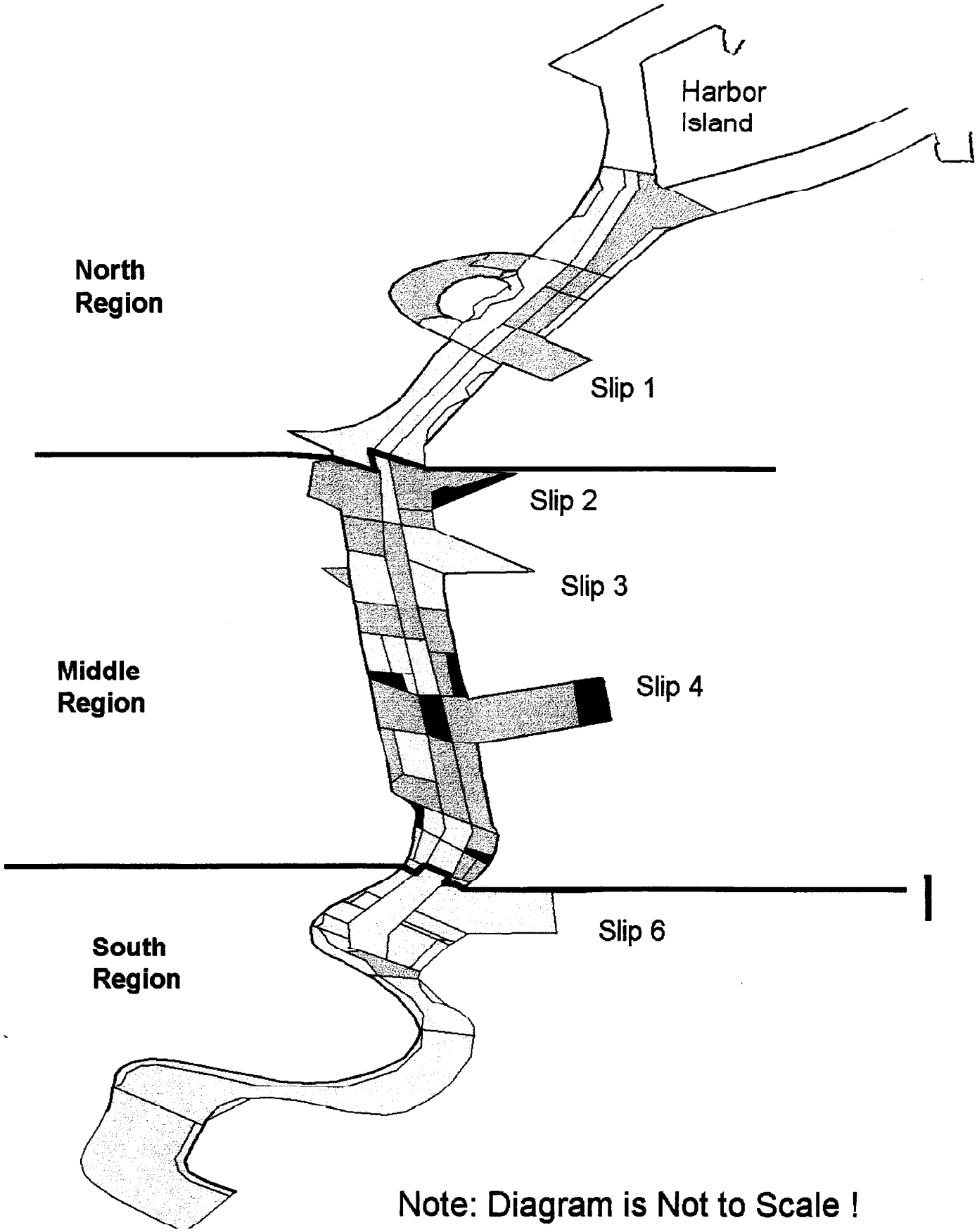

Harbor Island
Kellogg Island
Slip 1
Slip 2
Slip 3
Slip 4
Duwamish Waterway
Slip 6
Turning Basin
PCT Concentrations (ppb)
1 to 10
10 to 100
100 to 1000
1000 to 10000
10000 to 100000
N
KM
1
Data from NOAA sediment characterization study 1997

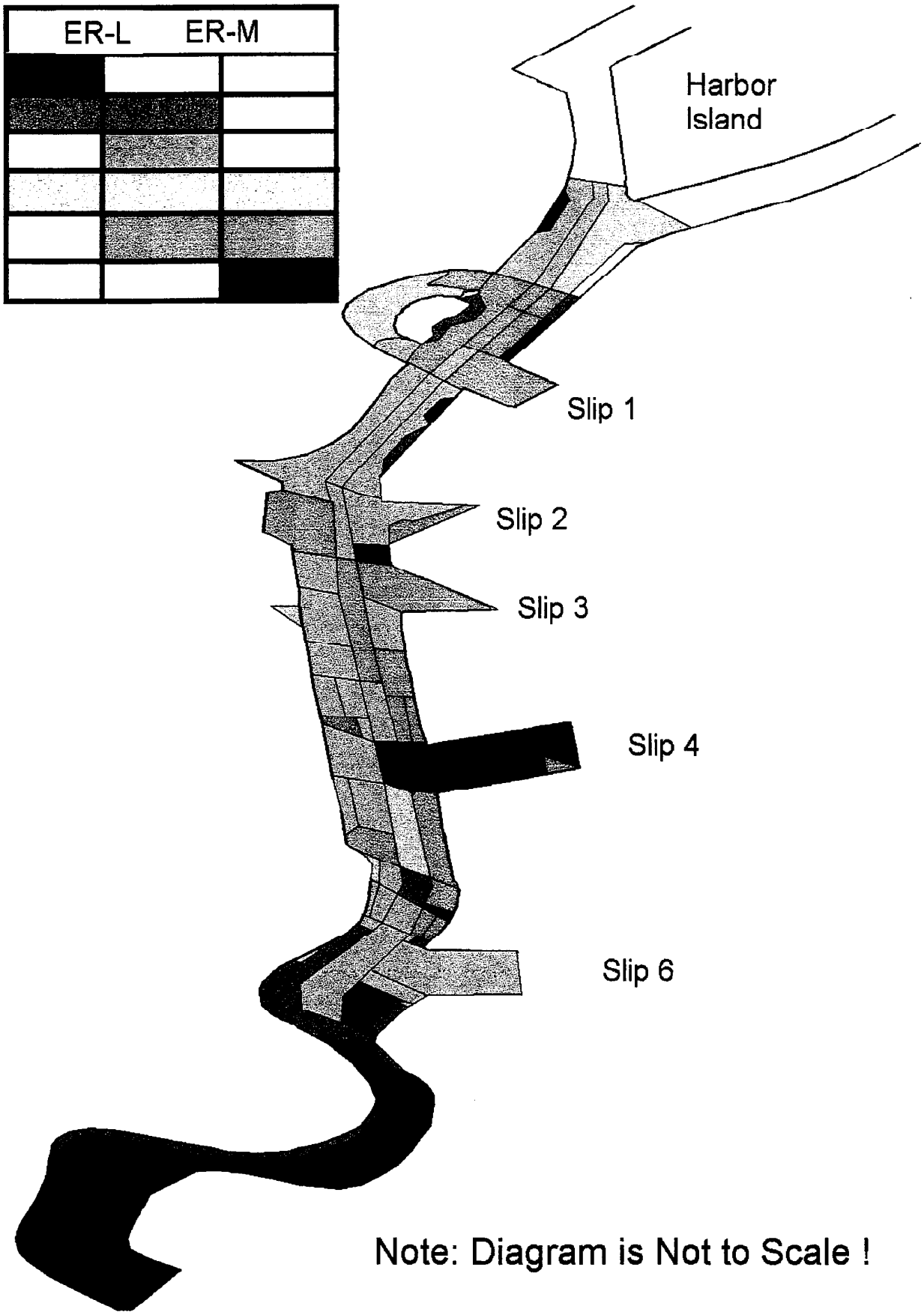


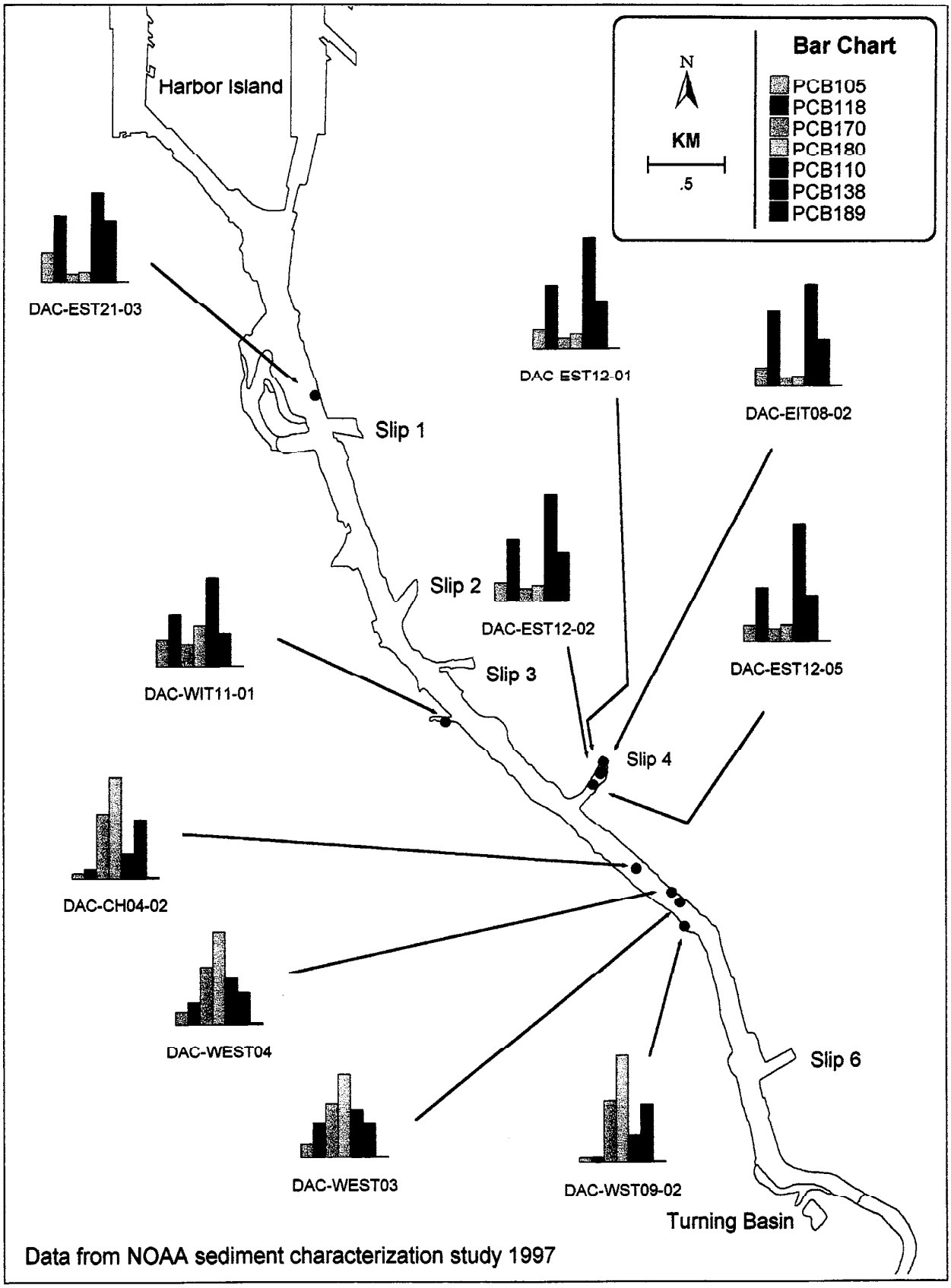


Observed distributions of PCB and PCT concentrations in the Duwamish Waterway sediment samples

Area Exceeding Sediment Quality Standard			
Habitat Regime	**Area (acres)**	**Area > 12 mg/Kg (normalized for TOC)**	**% Area > 12 mg/Kg**
Eastern Intertidal	21.8	7.06	32.4
Eastern Subtidal (including Weston)	121.8	26.46	21.7
Channel	89.9	14.75	16.4
Western Subtidal	94.4	7.68	8.1
Western Intertidal	40.6	14.97	36.9
Total	**368.5**	**70.91**	**19.2**


Harbor
Island
North
Region
Slip 1
Slip 2
Slip 3
Middle
Region
Slip 4
Slip 6
South
Region
Note: Diagram is Not to Scale !


ER-L
ER-M
Harbor
Island
Slip 1
Slip 2
Slip 3
Slip 4
Slip 6
Note: Diagram is Not to Scale !


Harbor Island
N
KM
.5
Bar Chart
PCB105
PCB118
PCB170
PCB180
PCB110
PCB138
PCB189
DAC-EST21-03
DAC EST12-01
DAC-EIT08-02
Slip 1
Slip 2
DAC-EST12-02
DAC-WIT11-01
Slip 3
DAC-EST12-05
Slip 4
DAC-CH04-02
DAC-WEST04
Slip 6
DAC-WEST03
DAC-WST09-02
Turning Basin
Data from NOAA sediment characterization study 1997